

# Newcastle Disease Sweden



Swedish Board of Agriculture 20171025

# Background



- Sweden has for many years applied a strict non-vaccination policy as regards ND and has the status as a non-vaccinating country for ND according to EU legislation.
- Only single ND outbreaks about every second year; lately more often.
- Previous recent outbreaks:  
August 2017; November 2016; July 2014 - 3 premises; 2011 - 2 premises.

# Outbreak in one herd – IP 2 2017



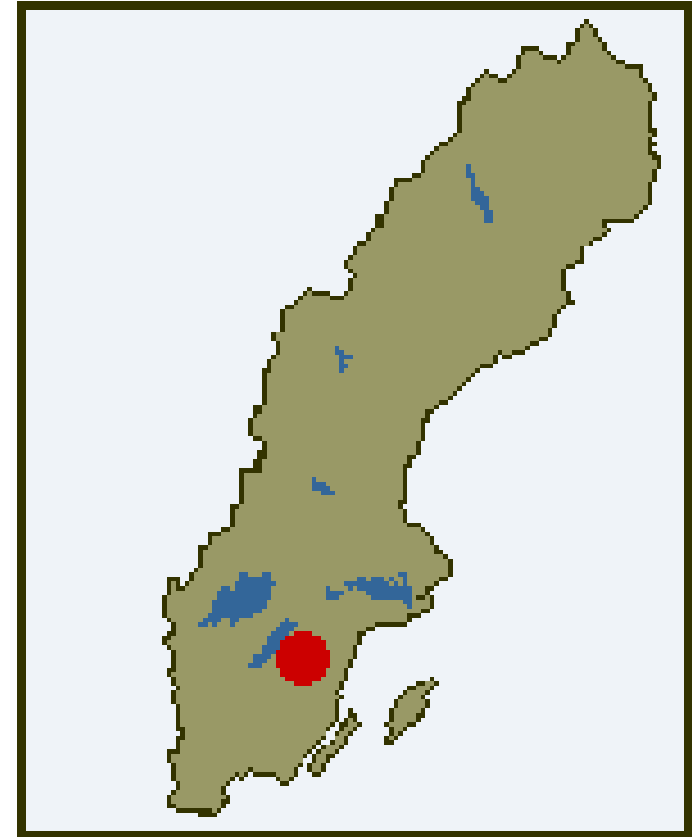
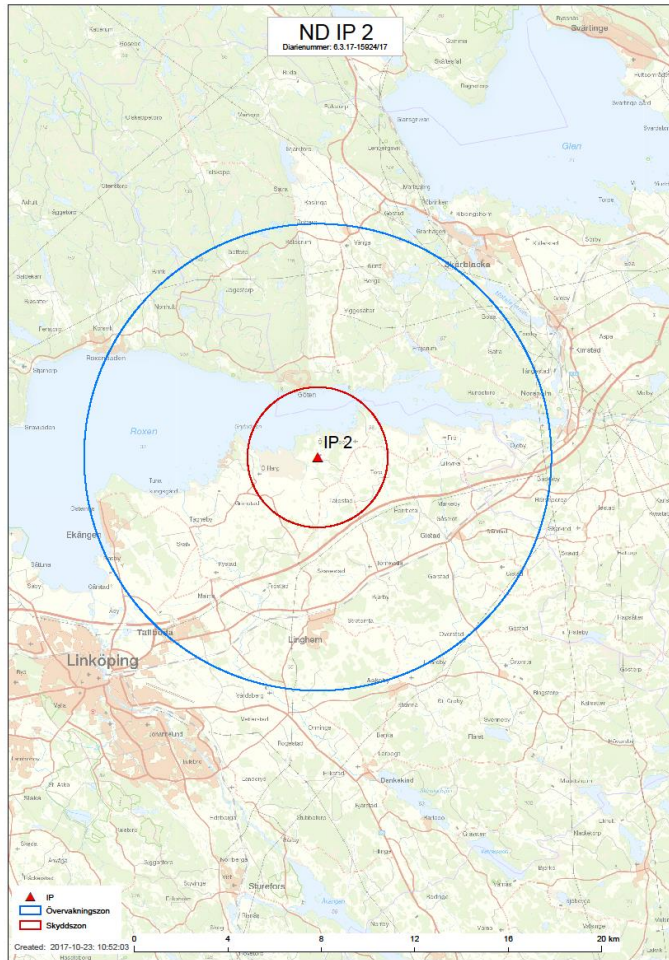
No known direct link with ND IP 1 2017 in Sweden.  
Source unknown but likely wild birds.

## IP2

- 14 000 egg-laying, caged hens.
- *Symptoms*: Small amount eggs with changes in the shell and a few shell-less eggs. No egg-drop. No increased mortality.
- Killing by gas in the shed.



# ND outbreak SE



# Measures and Information

- Protection zone (3 km) and surveillance zone (10 km)  
Stamping out, disposal of dead animals & products, cleaning & disinfection, tracing & recalling of products.
- No movement of live poultry, hatching eggs & not-heated poultry products from restriction area.
- No export of live poultry, hatching eggs & non-heated poultry products from 2 municipalities (Linköping and Norrköping).
- All contacts investigated & negative; no indications of spread.
- All hobby herds in restriction area are contacted.
- Written information to:
  - European Commission (who sent to MS)
  - CVO in the Nordic countries
  - Third countries

# Summary of outbreak

- 11/10 sampling due to diffuse symptoms.
- 13/10 change to suspicion, confirmation of ND in the evening, restriction zones and all restrictions and necessary measures according to Directive 92/66/EEC.
- 16/10 reporting ADNS and WAHIS (OIE).
- 17/10 killing of all birds; preliminary cleaning and disinfection.
- 7/11 plan lifting of protection zone.  
16/11 plan lifting all restrictions.

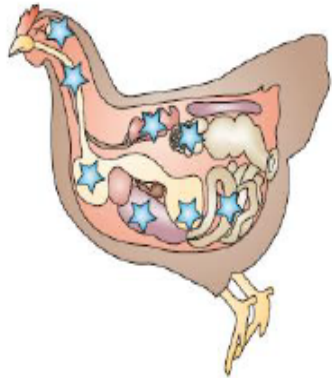
Avian paramyxovirus type 1 (APMV-1)



# Analyses from IP2 2017



- Samples from 60 hens were analyzed by PCR for paramyxovirus overnight.
- The cleavage site was sequenced for pathogenicity and the virus was concluded to be virulent, thus ND. The virus belongs to APMV-1 Class II, genotype XIIIa (previously genotype VIIb) and lineage 5b, same genotype as in previous outbreaks in SE; 1997).



Cleavage site motif;

**GG112-RRQRRFIGA-116**



Genotype VI (PPMV-1)

Genotype XIIIa\* (earlier VIIb alt. Lineage 5b)

The evolutionary history was inferred using the Maximum likelihood method based on 300bp of the fusion gene of Swedish isolate of avian paramyxovirus type 1 (1990-2017). The percentage of replicate trees in which the associated taxa clustered together in the bootstrap test (2000 replicates) are shown next to the branches.

\*Dimitrov et al. / Infection, Genetics and Evolution (2016)



# Virus isolation

Attempts to isolate virus are ongoing.

Materials for VI:

- Intestinal organs
- Brain tissue
- Lungs & trachea
- Oviduct
- Liver
- Spleen
- Kidney



Virus isolation on embryonated eggs;  
test for HI, if neg. new passage etc =>  
3 weeks.

# Virus isolation IP1-2017 and previous outbreaks in Sweden

- Isolated virus strains are always forwarded to the EURL.
- For 2016 and IP1-2017, attempts to isolate virus are still ongoing.
- Difficulties in isolating virus are related to:
  - the mild clinical symptoms: shell abnormalities without morbidity or mortality in animals => difficulties in sampling the right animals, and at the time of viremia.
  - possibly, pooling of materials.
  - viral recovery of NDV strains of low virulence well known to be challenging.
  - time-consuming procedure in BSL-3 premises.

# Comment on clinical expression

- Despite the fact that Newcastle disease is defined by pathogenicity (as proven by molecular tests or by ICPI tests) the virus is known to show great variation in clinical expression.
  - Ranges from asymptomatic to high mortality.
- Expression dependent not only on strain, but also on environmental conditions, nutrition, age of animals (production system) and presence of co-infections.
- Early detection of symptoms as well as and absence of e.g. IBDV (infectious bursal disease virus) and APV (avian metapneumovirus) in Swedish poultry contributes to the mild clinical expression in Swedish outbreaks.



Thank you for your attention!

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